

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
22 January 2004 (22.01.2004)

PCT

(10) International Publication Number  
WO 2004/008164 A1

(51) International Patent Classification<sup>7</sup>: G01R 31/308,  
31/311, G02B 21/00, G01R 31/265

(21) International Application Number:  
PCT/PH2002/000013

(22) International Filing Date: 9 July 2002 (09.07.2002)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicants and

(72) Inventors: SALOMA, Caesar, A. [PH/PH]; National Institute of Physics, College of Science, University of the Philippines, Diliman, Quezon City 1101 (PH). DARIA, Vincent, Ricardo, M. [PH/PH]; National Institute of Physics, College of Science, University of the Philippines, Diliman, Quezon City 1101 (PH). MIRANDA, Jelda, Jayne, C. [PH/PH]; National Institute of Physics, College of Science, University of the Philippines, Diliman, Quezon City 1101 (PH).

(74) Agent: VILLARAZA & ANGANGCO Law Offices  
And its attorneys; 5th Floor, LTA Building, 118 Perea  
Street, Legaspi Village, 1229 Makati City (PH).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**

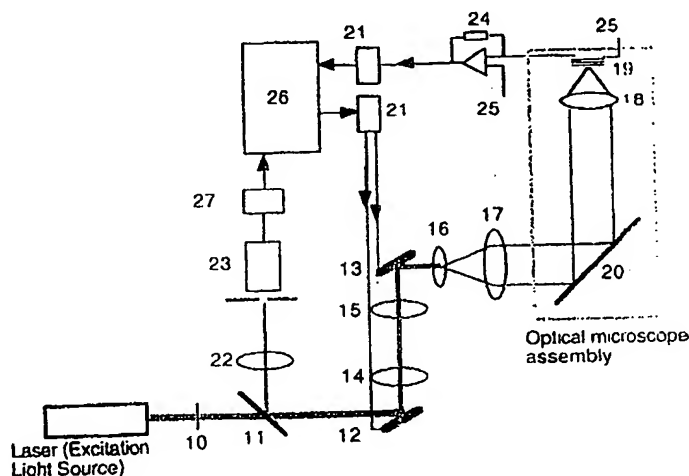
— of inventorship (Rule 4.17(iv)) for US only

**Published:**

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD FOR GENERATING HIGH-CONTRAST IMAGES OF SEMICONDUCTOR SITES VIA ONE-PHOTON OPTICAL BEAMINDUCED CURRENT IMAGING AND CONFOCAL REFLECTANCE MICROSCOPY



(57) Abstract: A method is disclosed that permits the generation of exclusive high-contrast images of semiconductor sites in an integrated circuit sample (19). It utilizes the one-photon optical beam-induced current (1P-OBIC) image and confocal reflectance image of the sample that are generated simultaneously from one and the same excitation (probe) light beam that is focused on the sample (19). A 1P-OBIC image is a two-dimensional map of the currents induced by the beam as it is scanned across the circuit surface. 1P-OBIC is produced by an illuminated semiconductor material if the excitation photon energy exceeds the bandgap. The 1P-OBIC image has no vertical resolution because 1P-OBIC is linear with the excitation beam intensity. The exclusive high-contrast image of semiconductor sites is generated by the product of the 1P-OBIC image and the confocal image. High-contrast image of the metal sites are also obtained by the product of the complementary OBIC image and the same confocal image.

WO 2004/008164 A1